

(No Model.)

3 Sheets—Sheet 1.

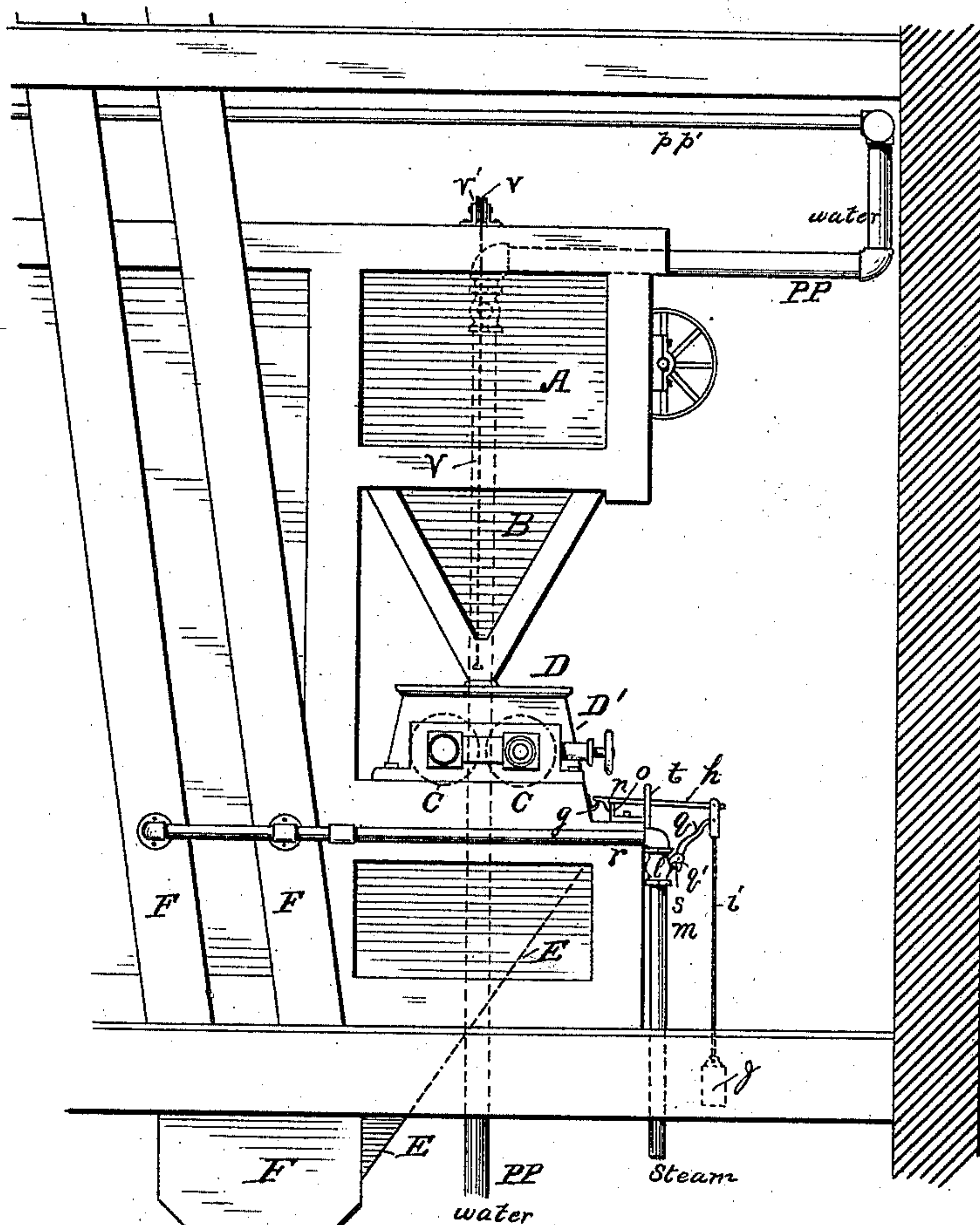
C. J. HEXAMER.

MECHANISM FOR EXTINGUISHING FIRES IN GRAIN OR MALT MILLS.

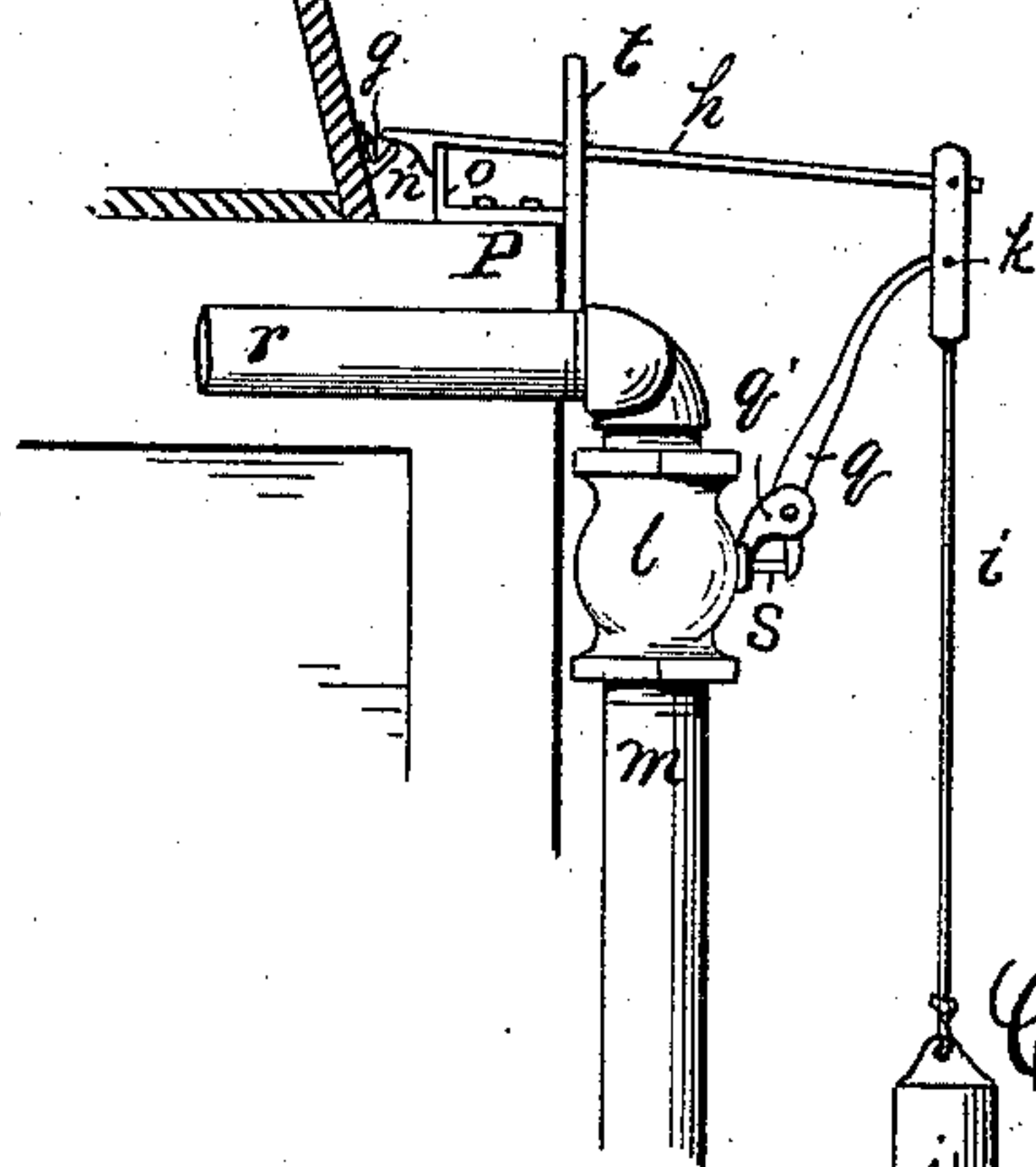
No. 331,058.

Patented Nov. 24, 1885.

*Fig. 1.*



*Fig. 4.*



WITNESSES:

*John Nolan.*  
*A. Heubner*

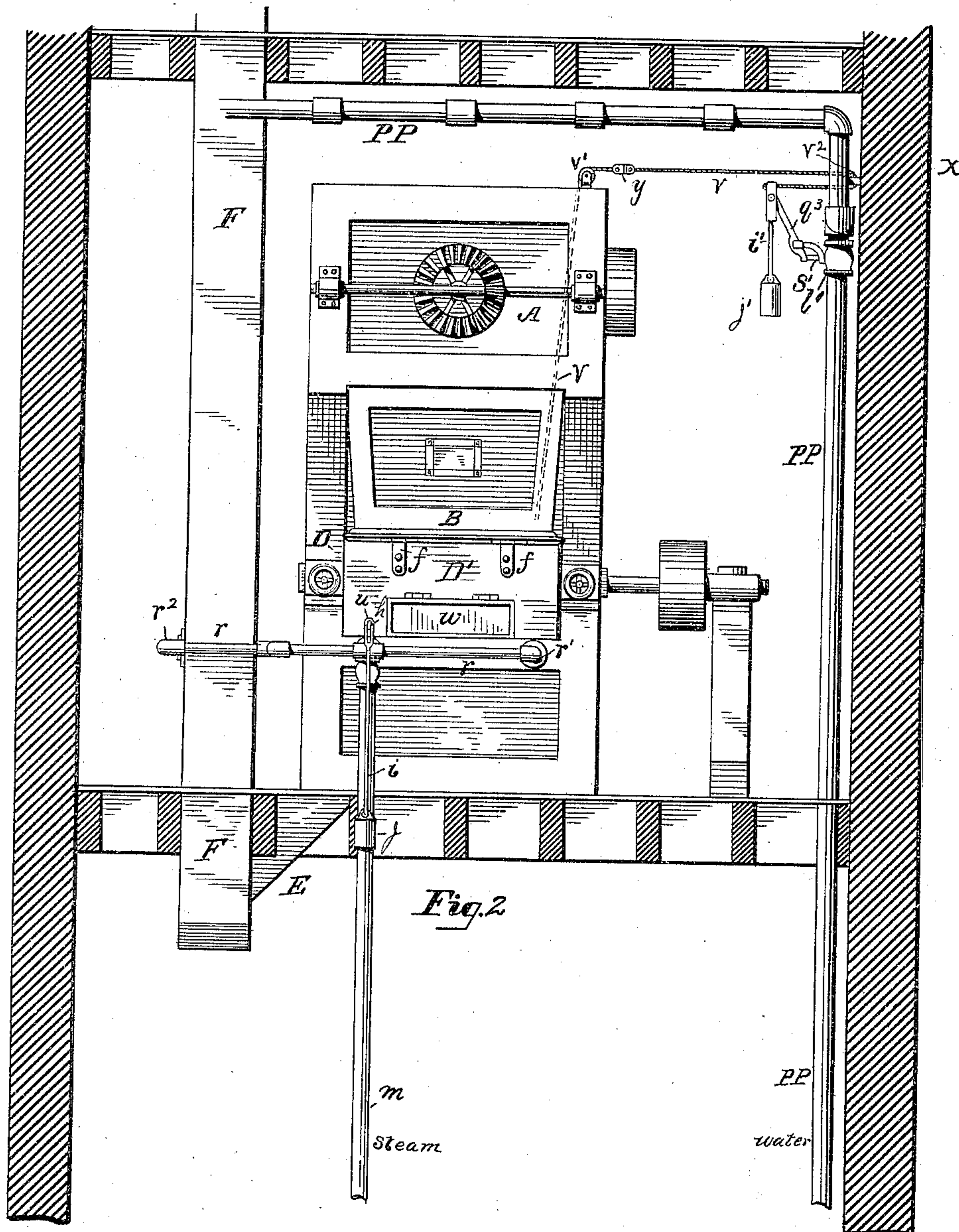
INVENTOR

*Charles John Hexamer,*  
*per Joshua Pusey, atty.*

(No Model.)

3 Sheets—Sheet 2.

C. J. HEXAMER.  
MECHANISM FOR EXTINGUISHING FIRES IN GRAIN OR MALT MILLS.  
No. 331,058. Patented Nov. 24, 1885.



WITNESSES:

John Nolan,  
A. H. Leubner

INVENTOR

Charles John Hexamer,  
per Joshua Pusey atty.



(No Model.)

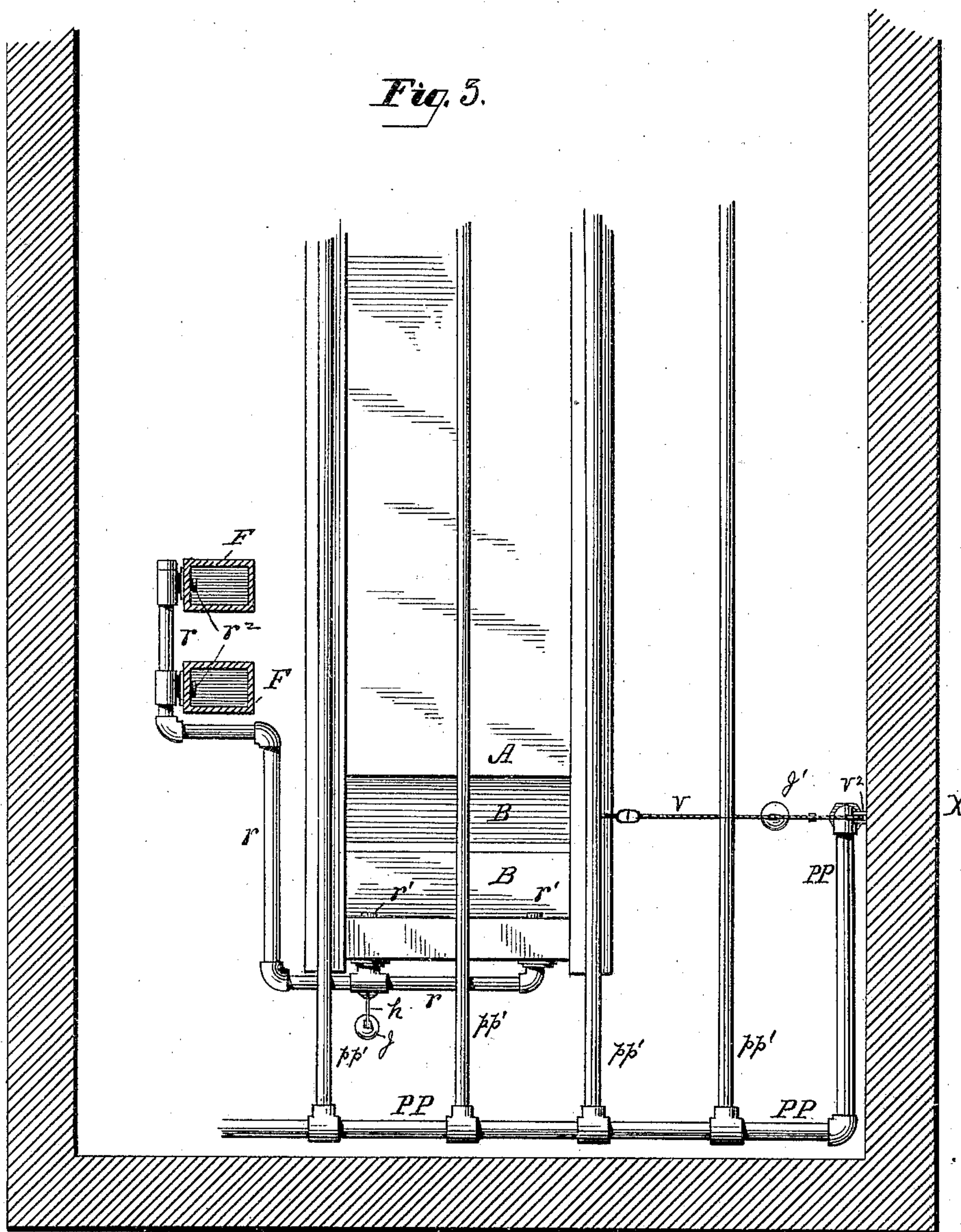
3 Sheets—Sheet 3.

C. J. HEXAMER.

# MECHANISM FOR EXTINGUISHING FIRES IN GRAIN OR MALT MILLS.

No. 331,058.

Patented Nov. 24, 1885.



WITNESSES:

John Nalan,  
St Helens

INVENTOR

Charles John Hexamer,  
per Joshua Pusey, atty.



# UNITED STATES PATENT OFFICE.

CHARLES JOHN HEXAMER, OF PHILADELPHIA, PENNSYLVANIA.

MECHANISM FOR EXTINGUISHING FIRES IN GRAIN OR MALT MILLS.

SPECIFICATION forming part of Letters Patent No. 331,058, dated November 24, 1885.

Application filed March 16, 1885. Serial No. 159,001. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES JOHN HEXAMER, a citizen of the United States, residing at the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Mechanism for Extinguishing Fires in Grain or Malt Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Figure 1 is a side elevation of a grain-mill provided with my improvements; Fig. 2, a front elevation thereof; Fig. 3, a plan, and Fig. 4, a detail, enlarged, of steam-valve-opening devices.

My invention relates to means for extinguishing fires resulting from dust-explosion in malt or grain mills. In my Letters Patent No. 292,488, dated January 29, 1884, and also in an application for a patent filed by me August 24, 1883, Serial No. 104,622, I have shown and described mechanism for this purpose, and my present invention is an improvement upon those of said patent and pending application.

Referring to the annexed drawings, A is the cleaner-box of an ordinary malt or grain mill. B is the hopper into which the grain falls from the cleaner contained within box A, thence descending between the usual rollers, C, (shown in dotted lines in Fig. 1,) journaled within the mill-box D. The crushed malt or grain drops into an inclined chute, E, which communicates with the interior of the elevator-boot F, leading to the upper stories of the building.

It is a well-known fact that serious fires have resulted from explosions of the impalpable dust or powder formed within the mill-box in the process of crushing the grain, which dust has become ignited by sparks caused by the crushing-rollers C striking some hard foreign body in the grain. By the application of my improvements such fires are either absolutely prevented or are extinguished at their incipency.

In carrying out my invention I suspend one side, D', of the mill-box by means of hinges *f* on the upper edge thereof, whereby, in case of an explosion within the box, the side will be free to be blown open, and thus provide a vent for the gases, and at the same time open the valve of the steam-supply pipe, as herein-

after described. Near the lower edge of the part D', I secure a trigger, *h*, whose outer extremity has attached thereto a vertically-de- pending rod, *i*, bearing a weight, *j*. Pivoted to the latter rod, at *k*, is the long arm of a lever, *q*, pivoted to a lug, *q'*, of the valve-chamber *l*, whose short arm impinges against the stud *s* of a well-known form of spring cock or valve contained within said chamber *l* of the pipe *m*, leading from the steam-boiler. The horizontal trigger *h* has an offset or downward projection, *n*, which bears against the face of a lug, *o*, that is bolted to the frame- work P of the mill, all as shown most clearly in Fig. 4. The steam-pipe has a branch, *r'*, opening into the mill-box, and pipes *r*<sup>2</sup> leading into the elevator-boot F.

In case of an explosion within the mill-box, the side or door D' will be blown outward, and the lug *g*, attached to said door, bearing against the under side of the trigger *h*, releases the latter from the lug *o*; and it will be obvious the rod *i* will instantly drop, and the short end of the lever *q* will be forced against the valve-stud *s*, thereby opening the valve and allowing the steam to rush into the mill-box and elevator-boot.

*t* is simply a standard with an eye, *u*, therein, through which the trigger *h* passes. The object of this is merely to limit the throw of the said trigger, in order to prevent it from striking the mill attendant or other person who may be standing by when the explosion occurs.

*w*, Fig. 2, is a small door hinged to the movable side D', in order to permit the inspection of the interior of the mill-box whenever desired. The lug *g* may be dispensed with, in which case the lower edge of the hinged part D' would rest against or contiguous to the adjacent end of the trigger *h*.

Although the hopper will usually be filled with the grain or malt, whose weight or inertia will form a barrier or resistance to the force of an explosion within the mill-box in an upward direction, I provide a means for extinguishing the fire in case it should accidentally find its way up through or into the hopper. This consists of a rope, *v*, preferably saturated with some inflammable substance, whose lower extremity is fastened to the side of the hopper, near the bottom thereof, and extending upon the inside of the hop-



per and the cleaner-chamber A, and passing over a support or sheave,  $v'$ , thence extends horizontally, passes over another sheave or support,  $v^2$ , secured to the inside of the wall or partition  $x$ , and connects with the upper end of a vertical rod,  $i'$ , bearing a weight,  $j'$ . This rod is pivoted to the long arm of a pivoted lever,  $q^3$ , whose short arm bears upon the outer end of the stud  $s'$  of a normally-closed valve within a chamber,  $l'$ , of a water-supply pipe, P P. These parts are similar in their construction and operation to the like parts as previously described in connection with the steam-supply pipe.

With the main supply-pipe P P are connected distributing-pipes  $p p'$ , running along the ceiling of the apartment in which the mill-box is situated. These pipes have a series of sprinkling-apertures in the lower sides thereof. Should the fire extend up into the hopper, the flames will sever the rope  $v$  by burning the same, whereupon the weighted rod  $i'$  will fall, and the short arm of lever  $q^3$ , pressing against the valve-rod  $s'$ , opens the valve, and the escaping water sprinkles and floods the room.

I prefer, also, to make the rope in two sections, and join them together by means of a fusible plug or connection,  $y$ , Fig. 2, that is adapted to melt at a temperature of, say,  $150^\circ$  Fahrenheit, so that in case the flames shall not sever the rope the rod  $i'$  will be allowed to drop by the fusing of said connection.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the mill-box, of the movable or hinged part or side D' thereon, a steam-supply pipe with suitable connection to the point of explosion or fire in the mill, and provided with a normally-closed valve, and tripping devices for operating said valve by the sudden movement of said hinged side of the mill-box by the force of a dust-explosion within the latter, substantially as and for the purposes set forth.

2. The combination, with the mill-box, of the hinged part or side D', the trigger provided with the notch or offset  $n$ , the lug  $o$ , the steam-supply pipe leading into the mill-box, the weighted rod  $i$ , and a normally-closed valve in said steam-pipe, all constructed and adapted to operate substantially as and for the purpose set forth.

3. In combination, in a grain or malt mill, the hopper, the inflammable rope extending and secured within the same, the water-supply flooding-pipe, the normally-closed valve, and the weighted rod adapted to open said valve by its descent, the upper end of said rope being connected with said weighted rod, all constructed and adapted to operate substantially as and for the purpose described.

In testimony whereof I have hereunto affixed my signature this 28th day of February, A. D. 1885.

CHARLES JOHN HEXAMER.

Witnesses:

JOHN NOLAN,  
LISLE STOKES.